

COVER SHEET FOR AMENDMENT OF POST-TRAVEL SUBMISSION

Instructions: Use this form as a cover sheet for any paperwork you may need to submit to the **Office of Public Records** in order to make your Privately Sponsored Post-Travel Submission complete in accordance with Rule 35. **Only complete this form if you need to submit an amendment to a post-travel filing you have already submitted.**

SUBMIT DIRECTLY TO THE OFFICE OF PUBLIC RECORDS IN 232 HART BUILDING

Name of Traveler: Senator Chris and Mrs. Annie Coons

Employing Office/Committee: Office of Senator Chris Coons

Travel Expenses Paid by (List all sources): Aspen Congressional Institute

Travel Date(s): Monday, 4/10, 2023 - Saturday, 4/15, 2023

Description/Title of Attached Forms: Post Travel Disclosure - updated to reflect AV costs

Agenda - updated agenda of confernece

Purpose of Amendment (describe the reason for amending original submission): New post travel disclosure
includes updated costs for AV/Room space costs

4/18/23

(Date)



(Signature of Traveler)

RE-3 Senators and Officers Post Travel Disclosure of Travel Expenses

Date/Time Stamp

Post Travel Filing Instructions: Complete this form within 30 days of returning from travel. Submit all forms to the Office of Public Records in 232 Hart Building. This form is a public disclosure. The form and all attachments will be made publicly available.

Certification: In compliance with the Regulations Governing Privately Sponsored Travel, Senate Rule 35, and the Honest Leadership and Open Government Act of 2007, I certify that I accepted the following gift of privately sponsored travel:

Private Sponsor(s):**Travel Dates:**

Aspen Institute, Inc. (Congressional)

April 10-April 15, 2023

Name of accompanying family member (if any):**Relationship to Traveler:**

Ann Coons

spouse

Total Expenses

Transportation Expenses	Lodging Expenses	Meals Expenses	Other Expenses (Amount & Description)
\$12,090	\$1196	\$1,140	\$600

I also certify that attached to this form are all required documents for post travel disclosure, including:

- The final Private Sponsor Travel Certification Form with all attachments
- The final invitation
- The final approved itinerary

I certify that all trip information reflected in the attachments above accurately reflects the travel that I accepted. If there were any changes to the trip after I received approval from the Committee, the changes are described in ATTACHMENT 1.

I have made a determination that the expenses set out above in connections with travel described in the Employee Pre-Travel Authorization form, are necessary transportation, lodging, and related expenses as defined in Rule 35.

Date

Signature of Senator/Officer

ATTACHMENT 1 – CHANGES FROM APPROVED PRE-TRAVEL

Note: Material changes to a trip that occur after the Committee has issued an approval letter may invalidate the Committee's approval. Please contact the Committee with any questions regarding changes to an approved trip.

Were there any changes to the pre-approved travel expenses? (Transportation, Meals, Lodging, Other)?

☒ Yes ☐ No

Expense Change	Revised Amount	Explanation
Travel (+\$1,036)	\$12,090	Added ground transportation costs
Other: (+\$600)	\$600	private mtg. space, AV, & conference services

Were there any changes to the pre-approved itinerary?

☒ Yes ☐ No

Explanation:

See attached agenda:

- 1) Speakers added to the agenda
- 2) Updated travel costs

Were there any additional changes to the pre-approved trip?

☒ Yes ☐ No

Explanation:

See attached agenda:

- 1) Speakers added to the agenda
- 2) Updated travel costs

Aspen Institute Congressional Program

Strategies to Ensure Global Food Security:

U.S. Policies to Sustain Supply, Relief, and Advance Prosperity

April 10-15, 2023 – Bellagio, Italy

AGENDA

MONDAY, APRIL 10:

U.S. participants depart the United States today.

Sen. Chris Coons and his wife, Ann Coons, depart New York at 4:25 pm on Delta 172.

TUESDAY, APRIL 11:

U.S. participants arrive in Bellagio, Italy by mid-afternoon.

Sen. Chris Coons and Ann Coons arrive in Milan at 6:45 am and are transported by van to Bellagio, Italy.

7 – 9 PM: Working Dinner

Seating is arranged to expose participants to a diverse range of views and provide the opportunity for a meaningful exchange of ideas. Scholars and lawmakers are rotated daily. Discussions will focus on food security in the United States and around the world.

WEDNESDAY, APRIL 12:

8 – 8:55 AM: Breakfast

9 – 9:15 AM: Introduction and Framework of the Conference

This conference is organized into roundtable conversations, a luncheon, and pre-dinner remarks. This segment will highlight how the conference will be conducted, how those with questions will be recognized, and how responses will be timed to allow for as much engagement as possible.

Speaker:

Charlie Dent, *Executive Director, Aspen Institute Congressional Program; Vice President, Aspen Institute*

9:15 – 11 AM: Roundtable Discussion

The World Food Price Crisis

After the height of the COVID-19 pandemic, supply chain issues, inflation, and Putin's ongoing war in Ukraine, a major agricultural exporter, Americans saw the economic effects of these events firsthand with empty grocery store shelves and high food prices. These impacts have shown that while food security remains a humanitarian issue in developing nations, it also can affect world powers, including the United States.

World food price crises are occurring with increasing frequency. We are in the third crisis since 2008, however this is the first to have a significant impact on retail prices in the U.S. and other high-income countries. In low-income countries consumers have suffered severe impact on their food security in all three price spikes.

The current food price crisis is more pronounced and is having a greater impact in all regions of the world. When COVID-19 closed the economy, American consumers quickly shifted from two-thirds of their food expenditures going toward food consumed away-from-home to two-thirds at-home, and supply chains struggled to adjust to that sudden shift. Income transfers from the government sustained consumer purchasing power in the face of losses of employment due to COVID-19. Food processors, particularly animal slaughtering facilities, struggled to sustain production while trying to make the work environment safe enough for employees to continue to come to work.

Animal diseases that caused loss of farm production capacity in several countries have further amplified food price increases. China lost a significant fraction of its pig population (the largest in the world) to a swine disease, and more recently, avian influenza caused the destruction of a substantial fraction of the U.S. laying hen population, causing the price of eggs to explode.

On top of these forces that were already causing food prices to rise came Putin's invasion of Ukraine, followed by sanctions on economic relations with Russia. Both Russia and Ukraine are important agricultural exporters, and Russia is also a significant supplier of fertilizer, an essential agricultural production input to the world market. Both agricultural commodity prices and the cost of agricultural production around the world rose further.

This conference will probe in depth the fundamental forces driving food security at the individual, national and global levels today, and even more importantly, in the future in a world in which all agro-ecosystems are migrating due to climate change.

Speakers:

Christopher Barrett, *Stephen B. & Janice G. Ashley Professor, Dyson School of Applied Economics and Management, and Professor, Brooks School of Public Policy, Cornell University*

Tjada D'Oyen McKenna, *CEO, Mercy Corps*

Paul Polman, *Co-author of "Net Positive"*

11 – 11:15 AM: Break

11:15 AM – 1 PM: Roundtable Discussion

Global Food Security

Global food security is defined as the extent to which the world can produce enough food containing all the essential nutrients (calories, amino acids, vitamins, and minerals) to feed the world's larger population better than today at reasonable cost without damaging the environment. This challenge must be addressed in a holistic manner in which nutrient-dense foods, e.g. fruits and vegetables that have high vitamin and mineral content, are given high priority. Historically, too much focus has been on grain production, which supplies calories, but generally leaves deficiencies in various amino acids, vitamins, and minerals.

In 1798, Thomas Malthus, a British economist known for his theory on population, wrote that food production could not keep up with population growth and that starvation would limit the world's population. With the development of ocean shipping, vast new areas of land were brought into agricultural production in North and South America and Oceania. Engineering research developed machines that enabled every farmer to cultivate far larger areas of land and to manage larger herds of livestock and flocks of poultry. Research on genetics and the control of insects, diseases, and weeds resulted in big increases in production per acre of land and per farm animal. Instead of limiting population as Malthus predicted, global food output has grown faster than consumption, the long-term cost of food has trended downwards, and the world's population is now eight times larger than when Malthus wrote his book. There has always been variability around this trend line, but the three price spikes in the last 15 years suggest they are becoming more frequent.

All agricultural production, regardless of the production system – conventional, organic, or regenerative – begins with the genetic potential embodied in the plant seed or animal egg. Once a plant germinates or an animal is born, how much of that genetic potential is realized depends on adequacy of nutrition for the species' requirements, prevention of diseases that inhibit its growth, and avoidance of competition for nutrients (from weeds in plants and parasites in animals) and for light in the case of plants.

The two basic resources on which plant growth is based are the land, from which crops receive their required nutrients (nitrogen, phosphate, potassium, and some micronutrients), and water. To these must be added the climatic conditions above the land which determine the levels and variability of temperature and precipitation.

There is little more arable land available worldwide (certainly less than 10 percent) that is not presently forested or subject to erosion or desertification. Moreover, loss and degradation of many soils continues. The area of land in food production could be expanded more than this, but only by destruction of forests, with accompanying loss of wildlife habitat, biodiversity, and

carbon sequestration capacity, all unacceptable environmental outcomes. The only environmentally sustainable alternative is to increase productivity on the fertile, non-erodible soils already in crop production. Most of that available cropland is in remote areas of South America and Sub-Saharan Africa, where infrastructure is minimal, and soils are inferior in quality to many already in production.

There is an area of land larger than what is in crop production which does not receive enough rainfall for annual cropping which grows grass that ruminant livestock (cattle, sheep, goats, bison, deer, and camels) can convert into milk and meat, thereby contributing to the world food supply.

Land may not be the most binding constraint on future global food production. Water is likely to be even more limiting. In their irrigation, farmers account for 70 percent of the world's use of fresh water. With the rapid urbanization underway, cities are outbidding farmers for available fresh water. The world's farmers will likely have access to less fresh water in the future than today. To sustain present food production levels, they will have to increase the "crop per drop," the average productivity of the water they use.

Complicating this picture is the reality that the climatic constraints on agriculture are changing. Greater warming is occurring over land than over water, and the greatest increase is at the higher latitudes. The spatial distribution of precipitation is changing, and there is increased frequency of extreme climatic events, e.g. droughts and floods. Farmers need access to seeds that embody greater tolerance to high temperatures and resilience in the face of droughts, flooding and other adverse conditions. Farmers in some geographic locations will find it necessary to change what crops they are growing, and more of world agricultural production will likely need to move through international trade. In addition, farmers are being asked to help mitigate climate change by sequestering more carbon in the soil and reducing greenhouse gas emissions from their production practices.

To the definitions of global and national food security must be added "with minimum loss between the points of production and consumption." All agricultural commodities (and marine products, which also make an important contribution to global nutrition) are perishable. An estimated third of world food production is lost between the points of production and consumption. In low-income countries, where the marketing infrastructure is often deficient, the heaviest losses occur between the farm and retail market, and in high-income countries, the largest losses occur as food waste after retail. Grains which are stored with too high a moisture content spoil, and most fruit and animal products, e.g. milk, meat, and fish, spoil in the absence of refrigerated transport and storage.

This session will review the natural constraints on the world's farmers' ability to produce

enough food in an environmentally benign manner to feed the world's larger population better than today. It will take a holistic approach that recognizes the importance of producing enough of all the essential nutrients to sustain human health.

Speakers:

David Beasley, *Former Executive Director, United Nations World Food Programme*

Máximo Torero Cullen, *Chief Economist, Food and Agricultural Organization of the United Nations*

1 – 2 PM: Working Lunch

Discussion continues between members of Congress and scholars on global food security.

2 – 4 PM: Individual Discussions

Members of Congress and scholars meet individually to discuss topics raised during the conference. Scholars available to meet individually with members are David Beasley, Chris Barrett, Catherine Bertini, Robert Paarlberg, Pamela Ronald, Joseph Glauber, Máximo Torero Cullen, Devon Klatell, Tjada D'Oyen McKenna, Catherine Russell.

7 – 9 PM: Working Dinner

Seating is arranged to expose participants to a diverse range of views and provide the opportunity for a meaningful exchange of ideas. Scholars and lawmakers are rotated daily. Discussions will focus on the world food price crisis and global food security.

THURSDAY, APRIL 13:**8 – 8:55 AM: Breakfast****9 – 11:30 AM: Roundtable Discussion*****Crisis of Global Malnutrition***

According to the Food and Agriculture Organization (FAO) of the United Nations, "food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life." Adequate nutrition and absence of disease are the two essential conditions for health.

Both overnutrition and undernutrition cause hundreds of millions of premature deaths worldwide each year. The health problems associated with obesity are widely addressed in the media. Less well reported is the even larger number of deaths every year from starvation from lack of calories and from nutritional deficiency diseases from inadequate intake of all the essential amino acids, vitamins, and minerals, particularly vitamin A, iodine, iron, and zinc.

There are three essential conditions for individual food security:

1. Is there a safe, reliable, and reasonably priced supply of all essential nutrients available from local production or the market year around?
2. Does the household (or individual) have sufficient purchasing power to access a nutritionally balanced diet from home-grown sources or the marketplace?
3. Is a person healthy enough so the nutrients ingested can be absorbed and used by the body? Food intake is less effective at contributing to health if a person is sick or has parasites, just as medicine is less effective if a person is nutritionally compromised. The two essential contributors to health, nutrition, and medicine, are mutually reinforcing.

Very low-income people spend the largest fraction of their income on food. Before COVID-19 struck, an estimated (FAO) 750 million people (10 percent of the world's population) suffered "severe food insecurity," and 690 million went "hungry." According to the FAO's definition, people suffer "hunger" if they lack sufficient purchasing power to access even 1,800 calories per day, not enough to put in a medium level of physical activity. An estimated 75 percent of the extreme poverty in the world is rural, and most are farmers. The majority are female, and half are children. Despite being farmers, most of the extreme poor are net food buyers.

War, natural disasters, and economic crises cause a great deal of hunger in the world, but chronic hunger, which is much more widespread, is due mainly to poverty. Emergency feeding programs, such as the World Food Programme, play an essential role in addressing human crises. However, to "solve" the world's chronic hunger problem (Sustainable Development Goal #2), the world's poverty problem (Sustainable Development Goal #1) must be solved. For the health of the planet, these goals must be attained in a sustainable manner. To do this, the entire food system must be involved.

The world experienced rapid progress in reducing poverty during 1990 to 2017, but an estimated 131 million people worldwide were pushed back into extreme poverty during COVID-19 (Pew). The "new poor" tend to be more urban than rural, living in congested urban settings and working in sectors affected by lockdowns and mobility restriction, and more engaged in informal services or manufacturing, including food processing. Food availability was disrupted in many places, and with the increase in food prices, low-income people have been the most adversely affected by the current food price crisis.

This session will review the response to this crisis and address the longer-term challenge of eliminating global poverty and hunger. To do this, food security will be addressed at the individual, national and global levels.

Speakers:

Catherine Bertini, *Distinguished Fellow, Chicago Council on Global Affairs; Former Executive Director, World Food Programme*

Devon Klatell, *Vice President, Food Initiative, The Rockefeller Foundation*

Catherine Russell, *Executive Director, UNICEF*

11:30 – 11:40 AM: Break

11:40 AM – 1 PM: Roundtable Discussion

International Trade and Food Security

The global price of an agricultural commodity is determined by the balance between the volume supplied to the world market by exporting countries and the volume of that commodity purchased from the world market by all importing countries. Dependent as it is on rainfall and temperature, agriculture is an inherently risky business. International trade in agricultural commodities is the great balancing wheel that moves farm products from surplus production regions to deficit areas at any point in time. In this sense, international trade is an important food security risk management tool for every country.

With climate change shifting all agro-ecosystems and increasing the frequency of extreme climatic events such as droughts and floods, international trade is likely to take on an even greater national risk management role in the future. International trade needs to be kept as open as politically possible if world markets are to play this balancing wheel and risk management function.

In countries whose natural conditions make it possible to competitively produce more of a commodity than domestic consumers buy, the international market provides larger farm income and the opportunity for the farm sector to make a positive contribution to the country's balance of trade. The U.S. exports about a quarter of its agricultural production, contributing significantly to farmers' income and the U.S. balance of trade.

National food security is the potential for self-sufficiency that is both economically efficient and environmentally sustainable within a given country. The food supply is strategically important to every government. Every country needs to have a reliable, safe and nutritious, reasonably priced supply of food available from some combination of domestic production plus imports minus exports. Political realities prevent any government from putting its citizens in a position of being dependent on imports for its entire food supply. Every government must assess the risk-benefit balance between dependence on imports vs. the cost of national self-sufficiency. This is especially relevant in countries whose natural

conditions make production inherently costly (e.g. in desert countries) or they simply lack a sufficient area of arable land. Perceived reliability of supply is critical in an importing country's willingness to depend on the world market for part of its food supply.

The volume of future international trade in food and agricultural products will be determined by the dynamic changes that occur in the demand for food relative to the growth in production potential in each country. The world's population is projected to grow 22 percent from the present eight billion to about 9.8 billion by 2050. Of the 1.8 billion increase in the number of global mouths to be fed, about 950 million are projected to be in Sub-Saharan Africa, about 500 million in South and Central Asia, and about 200 million in North Africa and the Middle East. The population of East Asia is declining.

East and South Asia have twice as much of the world's population compared to its arable land, and virtually all their potentially arable land is already in production. The Middle East and North Africa have land, but they lack enough fresh water. It is hard to construe a scenario in which these three regions can be self-sufficient in food in the future; East Asia and the Middle East and North Africa are already large agricultural importing regions. Sub-Saharan Africa has roughly equal percentages of the world's population and arable land now, but it is the one region whose population is expected to almost double by 2050. A large source of uncertainty about the world's future food supply-demand balance is how successful Sub-Saharan Africa will be in achieving its food production potential, which greatly exceeds present levels. This will determine whether Sub-Saharan Africa in the future is a large food importer—on commercial or concessional terms—or even a net food exporter.

It is important to emphasize that population growth creates need, but not effective demand for more food. Low-income people already spend the bulk of their meager incomes on food. In 2015, before COVID-19, 41 percent of Sub-Saharan Africa's population was in "poverty" (less than \$1.90 (adjusted for differences in purchasing power across countries) per capita per day), as was 12 percent of South Asia's twice as large population.

As their incomes start to rise, low-income people spend most of the first increments to income on food. By about \$2 per day per capita income, most people can access enough calories. As their incomes rise from about \$2 to \$10 per capita per day, most people eat more fruits, vegetables, meat, eggs, dairy products, and edible oils, causing rapid growth in demand for raw agricultural commodities. However, after about \$10 per capita per day, from additional increments in their incomes people tend to buy more processing, services, packaging, variety, and luxury forms, but not more raw agricultural commodities.

To achieve the goal of ending hunger the poverty problem must be solved. However, to the extent we are successful at this, we unleash the most rapid phase of growth in the demand

for raw agricultural commodities. This increases the likelihood that the growing demand for food will outstrip the country's agricultural production capacity (unless it can increase agricultural productivity at least as fast). China's experience in recent decades is a prime example of successful poverty reduction being translated into growth in demand for food at a faster pace than domestic production could grow, resulting in China becoming the world's largest agricultural product importer.

The greatest uncertainty in projecting the future demand for food is how many hundreds of millions of low-income people will successfully escape poverty and, in turn, hunger. The United Nations Sustainable Development Goals have a target of eliminating poverty and hunger by 2030, goals that the world was not on track to attain even before COVID-19 set us back further.

For the world markets for food and agricultural commodities to successfully perform their balancing wheel role, there must be rules-of-the-road for trade that keep the flows of trade as fluid as possible. Until the Uruguay Round Agreement (1/1/1995) that created the World Trade Organization (WTO), there were no internationally accepted rules-of-the-road for agricultural trade.

In the Uruguay Round Agreement, the WTO's member countries agreed that whatever assistance an individual country provides to its agricultural sector should be commodity-neutral, i.e. not to distort the natural comparative advantage of any country by creating artificial incentives to advantage production of any one product more than others. Export subsidies were banned in agricultural commodities, as they had been for manufactured goods since 1979. The member countries agreed to convert all nontariff barriers to agricultural imports (e.g. quotas) to tariffs and reduce them over time. They also agreed to cap and reduce production- and trade-distorting agricultural subsidies.

The fraction of world agricultural production moving through international markets has more than doubled in the years since the Uruguay Round Agreement came into effect, to the significant benefit of American farmers. In recent years, the United States and other countries have backslid on their commitments to freer movement of agricultural products in world trade. Furthermore, the dispute settlement process within the WTO has been rendered ineffective by the unwillingness of the United States to allow new judges to be appointed, a somewhat surprising fact when the U.S. has won more cases than it has lost there.

This session will review the projected growth in international agricultural trade. It will further address the importance of keeping international markets as open as possible so they can play the balancing wheel role that will be needed as consumer demand in certain regions outgrows their agricultural production capacity and as greater variability in climatic

conditions caused greater year-to-year fluctuations in individual countries' food production

Speakers:

Joseph Glauber, *Senior Research Fellow, International Food Policy Research Institute; Former Chief Economist, Department of Agriculture*

Philippa Purser, *Head of Strategy and Global Process, Cargill*

1 – 2 PM: Working Lunch

Discussion continues between members of Congress and scholars on international trade and food security.

2 – 4 PM: Individual Discussions

Members of Congress and scholars meet individually to discuss topics raised during the conference. Scholars available to meet individually with members are Chris Barrett, Catherine Bertini, Robert Paarlberg, Pamela Ronald, Joseph Glauber, Devon Klatell, Tjada D'Oyen McKenna, Catherine Russell, and Rajiv Shah.

7 – 9 PM: Working Dinner

Seating is arranged to expose participants to a diverse range of views and provide the opportunity for a meaningful exchange of ideas. Scholars and lawmakers are rotated daily. Discussion will focus on global malnutrition and international trade and global food security.

FRIDAY, APRIL 14:

8 – 8:55 AM: Breakfast

9 – 11 AM: Roundtable Discussion

Public and Private Investments in Agricultural Research

There are important roles to be played in reducing future food insecurity by investments by both the public and private sectors, as well as by philanthropy. Financial analysis has demonstrated that investments in agricultural research have a high rate of return on investments made by both the public and private sectors.

Public support for agricultural research played a major role in the economic development of American and European agriculture. The resulting technologies were made freely available to all, often pushed out through an extension service which served as a two-way conduit of farmers' problems to researchers and solutions back to farmers.

Historically, public support for agricultural research in the U.S. was much larger than private sector support, however this reversed in the mid-1970s. In recent years there has been a burst of activity in venture capital funds investing in food and agricultural research. Today both the

Rockefeller Foundation and the Bill and Melinda Gates Foundation have major commitments to supporting agricultural research in low-income countries. The Gates Foundation was originally focused on health; however, it came to realize that when people are nutritionally compromised, the payoff to health investments is reduced. This recognition brought the Gates Foundation into also investing their philanthropy in agricultural development.

The private sector also played an important role in research on farm machinery, pesticides, and animal pharmaceuticals. To pay for the research (both successes and failures) and to provide a return to owners or shareholders, the resulting technology is embodied in production inputs that farmers buy. This is possible only when the intellectual property resulting from the research can be protected by patents or other "do not reproduce for sale" rules. In recent decades, with increased ability to patent biological materials, the private sector has come to play a much larger role in developing new agricultural technologies embodied in plant seeds than previously. In all cases the sales arms of the private sector companies play important roles in technology transfer to farmers.

Despite the high rate of return on both public and private investments in agricultural research and technology transfer, public support for it has been falling in the United States, Europe, and other high-income countries (in both domestic research and that financed through their foreign aid). Today the governments of both Brazil and China invest more in agricultural research than the United States.

Public support to domestic agricultural research institutions has dropped in recent decades across the high-income countries; the same has happened in their foreign aid. There are many areas of research in which the private sector will invest less than the socially optimum. These include basic research where the payoff is too uncertain or too far in the future, areas in which it is hard to protect the intellectual property resulting from the research or where no market exists, e.g. conservation and public policy. If the potential market is small, it is often difficult for the private sector to justify the investment cost. This is often the case with "orphan crops," including many fruits and vegetables.

Agricultural technologies often require very specific local agro-ecological conditions (soil and climate), so additional research is often necessary to adapt a crop to the conditions in a specific region. The tools of agricultural science are highly mobile across countries, but individual varieties or breeds often need additional research to optimize them for other locations than their origins. With all agro-ecosystems migrating away from the Equator and the incidence of extreme climatic events increasing, it is going to take more adaptive research just to sustain present productivity levels.

This brings us to the challenge of meeting the agricultural research needs of food-insecure

countries which have large numbers of impoverished farmers. Those farmers often lack the purchasing power to access improved seeds even if they are available, or lack sufficient collateral to access credit, even where credit institutions exist.

Frequently today the private sector has better research facilities and scientists to address these challenges than the public sector. Many firms are generous with their philanthropy, but the magnitude of the challenges is far greater than the private sector can be expected to solve on its own. Furthermore, many observers argue that there needs to be a balance between public and private sourcing of new technologies.

To meet future global food demand sustainably will require increases in global food system productivity. Where possible, we will need to make presently unusable soils productive, increase the genetic potential of individual crop and animal species and farming systems in the face of climate change, increase the productivity of the water used, reduce competition from weeds in crop production and parasites in animal production, and reduce post-harvest losses, all in an environmentally benign manner.

Fortunately, we are in the golden age of the biological and information sciences. The tools of modern science give us the potential to:

- Improve the nutritional content of staple foods (augment the deficient vitamins, minerals, and protein);
- Increase tolerance to adverse growing conditions (e.g. drought, temperature, wetness; salt);
- Internalize resistance to insects and diseases to reduce pesticide use;
- Slow down quality deterioration in perishables;
- Increase precision in application of fertilizer nutrients and pest control media

There is huge potential in food science research to enhance future food security. The next frontier includes vertical farming (growing plants in high rise buildings using hydroponics and artificial light), plant-based meats and beverages, cell-cultured meats and milk produced in fermentation vessels, and many others. A big question is whether these can be scaled up sufficiently to bring the unit cost of production down sufficiently to be competitive and provide a sufficient return to investors to attract the necessary capital. Many venture capitalists are betting that this is possible.

With projected population growth and broad-based economic growth and urbanization, which tend to change dietary patterns, the world needs to significantly increase food production using less water and little, if any, more land. The current level of investment is less than necessary for this to happen, much less use some agricultural output as raw material for biofuels. For the world to achieve zero hunger and use agricultural products as feedstocks from which to make biofuels will require a significantly larger investment in productivity-enhancing agricultural

research than is occurring at the present.

Anti-technology activists pose one of the greatest threats to global food security today. There is just as great potential for modern biological science to contribute to global food security, particularly in the face of climate change, as to improving human health through medicine, if only it is allowed to be applied.

This session will explore the potential for modern biological and information sciences to contribute to future global food security in a world in which climate is changing and do it in an environmentally benign way.

Speakers:

Pamela Ronald, *Distinguished Professor, Department of Plant Pathology & the Genome Center, University of California, Davis*

Robert Paarlberg, *Associate, Harvard Weatherhead Center; Professor Emeritus of Political Science, Wellesley College*

Erik Fyrrwald, *CEO, Syngenta Group*

11 – 11:15 AM: Break

11:15 AM – 1 PM: Roundtable Discussion:

Investments in Rural Development

Emergency feeding programs will always be needed to respond to food insecurity resulting from war, natural disasters, and politically imposed famine, however they will never be the solution to the chronic food insecurity experienced by 10 percent of the world's population. To solve chronic food insecurity, a reliable supply of foods that contain enough energy and essential amino acids, vitamins, and minerals to maintain health must be available from local production or markets year around. Availability is the necessary condition for eliminating hunger, but to eliminate hunger people must have sufficient purchasing power to access the available food. Since the extreme poor spend most of their meager incomes on food, the purchasing power of their income is determined mainly by the price of food.

An estimated 75 percent of the extreme poverty in the world is in rural areas, and most of the poor are farmers. The focus here will be on them.

Poverty is the motivation for a great deal of migration of the rural poor to higher income countries, and billions of dollars of the income they earn there get remitted back to their home countries each year. The large number of these migrants working in the U.S. and Europe, both documented and undocumented, has caused a significant political backlash against immigration. Moreover, few low-income country governments have the budgetary capacity or political motivation to make large income transfers to their low-income farmers.

A much more attractive long-term solution is to increase low-income farmers' income from the marketplace. The agricultural sector in many low-income countries is significantly underperforming relative to its potential. Current crop yields fall short of their agronomic potential consistent with economic efficiency and environmental sustainability. In Sub-Saharan Africa, for example, average crop yields are estimated to be only 25 percent of their agronomic potential using presently available technology.

The first means of reducing farmers' poverty is to increase productivity of the crops they are already growing. Next, farmers can change what they are producing to higher value-per-acre crops, e.g. fruits, vegetables, or nuts, or add livestock, poultry or aquaculture, to their product mix. This can have the additional benefit of improving the farm family's nutrition. Farmers may be forced to change what they are growing if local climatic conditions change sufficiently to render the crops they are now growing non-viable in their locality. In either case, the specificity of knowledge related to each new crop or animal species requires education.

Another way to reduce rural poverty is for farmers to acquire more land or other income-generating assets, such as education, in particular literacy, numeracy, and agronomic and animal husbandry skills and management skills to manage a larger farm. There is a finite limit to how much net income can be generated for a farm family from small holdings. In South Asia, for example, the average farm size is one to two acres, and virtually all the potentially arable land is already in production. There are few things that a small farmer can produce on so little land and generate an above-poverty family income. Indeed, this is the reason that in some regions farmers turn to growing poppies or other raw materials for illegal drugs.

Every country that has successfully reduced poverty in agriculture has created non-farm employment opportunities, both locally and further afield, for one or more members of the farm household. Most small farm households which escape poverty earn most of their family incomes from non-farm sources. This is true all over the world.

The next step is for significant numbers to leave farming completely and become employed in the non-farm sector. In fact, in the normal course of economic development, first the fraction of the workforce engaged in farming declines, and eventually their absolute number declines. When this happens, both those who leave and those who stay behind in farming and can gain access to more land have the potential to earn higher incomes. In very low-income countries the fraction of the workforce engaged in farming is often over 50 percent, while in the highest income countries it is in the very low single digits.

The private sector needs to build the agricultural input and product marketing, storage, and processing infrastructures (including cold chain to reduce post-harvest losses of perishables) which are critical to successful agricultural development. The track record of the public sector in these areas is not positive. The best role for the public sector is to define and enforce the rules-of-the-road for investment and commerce.

Only the private sector can create enough jobs to solve the problem of poverty in low-income countries' rural or urban areas, however government needs to provide a positive investment climate before investments of either local or international capital will be made. There must be reasonable macroeconomic and political stability, rule of law, a minimum of corruption, definition and protection of property rights, and enforcement of contracts.

To advance broad-based rural economic development--both agriculture and the rural non-farm economy-- investments in several rural public goods are needed. Here the public sector's role can be beneficially enhanced via official development assistance (foreign aid) and international development bank lending. Investments in rural infrastructure, education, health, and agricultural research and technology transfer are needed to solve the problem of rural poverty through development of agriculture and the rural non-farm sector. It is noteworthy that in the Uruguay Round trade agreement, every country's public sector investment in agricultural research and technology transfer and in rural infrastructure were accepted as public goods and therefore not restricted.

Historically, the governments of many low-income countries have placed low priority on agricultural and rural development in national budget allocations and in their international borrowing. In fact, until recently all low-income regions of the world extracted more tax revenue from their rural areas (usually through export taxes) than they invested in those areas. The balance of political power resides in their cities, even though their farmers often comprise large fractions of their populations. This has been a major impediment to their agricultural development. Today, Sub-Saharan Africa is the only remaining region where the net transfer of funds is away from rural areas.

While foreign aid and international development bank lending placed high priority on agricultural and rural development in the 1970s following a famine in South Asia, it peaked in the mid-1980s, and then went into precipitous decline. It recovered somewhat following the world food price crisis of 2008-10, only to quickly recede again when international agricultural commodity prices returned to more normal levels. The fraction devoted to agricultural research has fallen more than proportionately. The current food price crisis has once again heightened awareness of food insecurity, however, at present the main driver of increased priority on agricultural development has been climate change.

There are no quick fixes to rural poverty and associated hunger or to the underperformance of agriculture relative to its potential in low-income countries. Immense amounts of capital investment will be needed. The capital investment requirements to provide the essential rural public goods (rural roads, agricultural research and extension, and rural education and health services) vastly exceed the capacity of most low-income country governments. This is where foreign aid, lending by international development banks, and philanthropy such as that of the Rockefeller, Eleanor Crook, and Gates foundations can play a critical role in supplementing low-income countries' own resources.

If there is genuine concern about reducing poverty and hunger in low-income countries, their own governments need to provide a positive investment climate so the private sector can do as much as it can. The governments themselves, as well as foreign aid donors and international development banks, must also make and sustain budgetary commitment to agricultural and rural development. On-again off-again funding accomplishes little.

This session will review the roles that need to be played by the public and private sectors to achieve significant reductions in poverty and hunger in the world. Emphasis will be put on rural areas, where the largest concentrations of poverty and hunger exist. The magnitude of the investments needed by the public, private and philanthropic sectors will be discussed.

Speakers:

Strive Masiyiwa, *Founder and Executive Chairman, Econet Global and Cassava Technologies*
Rajiv Shah, *President, The Rockefeller Foundation*

1 – 2 PM: Working Lunch

Discussion continues between members of Congress and scholars on investments in rural development.

2:30 – 2:45 PM: Key Conference Takeaways

Speaker:

Rapporteur **Robert Thompson**, *Senior Fellow, Global Agricultural Development and Food Security, the Chicago Council on Global Affairs; Former Director of Rural Development, the World Bank*

2:45 – 3:45 PM: Policy Reflections (Members of Congress only)

All attendees can remain in the meeting however, this session is only for Members of Congress to discuss ideas and policies.

This time is set aside for Members of Congress to reflect on what they learned during the conference and discuss their views on implications for U.S. policy.

7 – 9 PM: Working Dinner

Seating is arranged to expose participants to a diverse range of views and provide the opportunity for a meaningful exchange of ideas. Scholars and lawmakers are rotated daily. Discussion will focus on public and private investments in rural development and agricultural research.

SATURDAY, APRIL 15:

8 AM: Participants depart the hotel for the airport to return to the U.S.

Sen. Chris Coons and Ann Coons depart Milan, Italy at 12:30 pm on Delta 185 and arrive in New York at 3:40 pm.